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## A NEW GENUS AND SPECIES OF MAYFLY FROM PERU

(Ephemeroptera: Leptophlebiidae)

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Among the specimens of mayflies collected by Drs. E. S. Ross and E. I. Schlinger during the California Academy of Science expedition to Peru are male imagoes of a remarkable new genus and species of the mayfly family Leptophlebiidae. The males, the only stage known, are immediately recognizable on the basis of the remarkable turbinate upper part of the eyes.

### Genus *Miroculis* Edmunds, new genus

(Figs. 1-5)

Small mayflies with forewings four to five mm long. Eyes of the male divided, the upper portion stalked, with large ommatidia (fig. 4), the upper portion of the eyes separated from one another by a distance equal to their diameter. Forelegs of male nearly as long as forewings; the length of various segments in relation to the femur are as follows, tibia 1.53, tarsus one .045, tarsus two and three .6, tarsus four .3, and tarsus five .15. Tarsus five of forelegs expanded apically. Claws dissimilar, one claw truncate, the other with a digitate hook. (Middle and hind legs broken from the specimens.) Wings and venation as in figures 1 to 3. Costal angulation of hind wing acute.

Type species: *Miroculis rossi* described below.

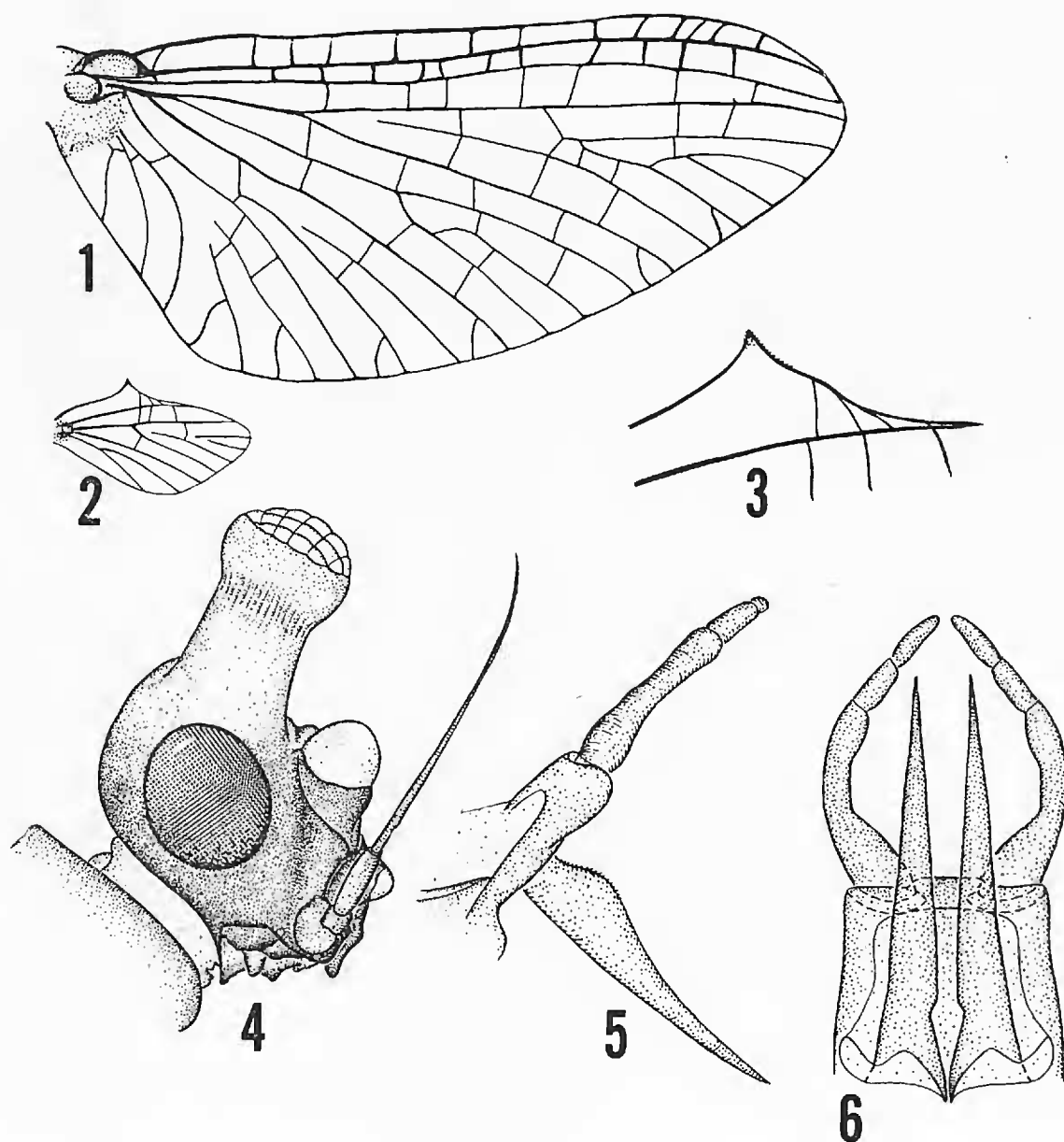
### *Miroculis rossi* Edmunds, new species

*Head* dark brown, the upper half paler; antennae with scape and pedicel smoky, the flagellum pale yellowish brown; lower portion of eyes grey; the sides of the turbinate portion light brown at base, paler above; the facets of the turbinate portion light yellow brown, separated by dark brown grooves.

*Thorax* dark brown, with darker smoky brown markings at margins of pronotum, along the mesonotum next to the outer parapsidal furrows and on the pleura at leg bases; the scutellum darker brown, forewings with

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venation as in figure 1, the stigmatic cross-veins variable in number from 5 to 9, cross venation somewhat variable, the marginal intercalaries constant in number in each interspace but variable in details of length and points of origin and destination; all veins medium brown; base of forewings suffused with brown; the stigmatic area sometimes lightly suffused with brown. Hind wings as in figures 2 and 3; venation brown; cross-veins variable,  $R_3$  of radius complete or incomplete at base, terminus of subcosta variable. Forelegs light yellow brown; the femora smoky brown in the basal two-thirds, a fuscus subapical band about as broad as the width of the femur; distal one-fourth of tibiae smoky brown to fuscus. (Middle and hind pairs of legs missing on all specimens). Abdominal segments 2 to 7 semi-hyaline; seg-



#### EXPLANATION OF FIGURES

Figs. 1-6, *Miroculis rossi*, male paratype; Fig. 1, Forewing; Fig. 2, Hind wing, drawn to scale of forewing. Fig. 3. Costal projection of hind wing, enlarged. Fig. 4. Head. Fig. 5. Male genitalia, lateral view, showing normal position in preserved specimens. Fig. 6. Male genitalia, dorsal view, with penes appressed to styliger plate.

ments 1 and 8-10 opaque; abdominal terga yellowish brown; the posterior portion shaded with fuscus, this dark marking not reaching the lateral margins; on terga 2 to 4 the fuscus shading covers the posterior half of the segments, becoming broader on terga 5 to 8 so that two-thirds or more is dark on segment 8; terga 8, 9 and 10 largely fuscus; tracheal trunks smoky, the spiracles slightly darker; sterna yellowish brown with dark bands produced by segmental overlap. Forceps and penes medium brown. Genitalia as in figures 5-6. Caudal filaments medium brown, the joints usually darker in the basal half of each filament.

Female imago and nymph unknown.

*Holotype male imago* (in alcohol) from PERU, YURAC, 67 ROAD MILES EAST OF TINGO MARIA, IV-28-1954, E. S. Ross and E. I. Schlinger. Paratopotypes, 2 male imagoes. All specimens in collection of California Academy of Sciences, San Francisco. Dr. Schlinger informs me that this locality is in the tropical rain-forest zone at approximately 300 meters elevation. The specimens were taken along a creek near the cafe at Yurac.

The latin generic name is in allusion to the remarkable eyes of the male. The specific name is given in honor of Dr. E. S. Ross who has made his excellent collections of Ephemeroptera available to me.

The genus *Miroculis* is unique in the family Leptophlebiidae by reason of the turbinate eyes of the male. Some Baetidae (e.g. the Peruvian *Pseudocloeon binocularis* Needham and Murphy) have superficially similar eyes, but such a development is not even approached in the known Leptophlebiidae although males of several genera have divided eyes. The wing venation of *Miroculis* is similar to that of the Neotropical genera *Hermanella* and *Homothraululus* and the genitalia are similar to those of *Hermanella* (see Traver, 1959). Like many of the Leptophlebiidae, the relationships of *Miroculis* will remain uncertain until more is known of the nymphal stages of South American Leptophlebiidae, but it is probably a specialized derivative of *Hermanella*. Because of the remarkable adult eyes, late instar male nymphs of the genus would presumably allow association of the nymph and adult without rearing; no specimens identifiable as nymphs of this genus were found in the Peruvian nymphal collections from the area.

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